

PATENT SPECIFICATION



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PROVISIONAL SPECIFICATION.

Improvements in Porous Elastic Fabrics and in the Production thereof.

I, PERCY HERBERT HEAD, of The Orchards, Station Road, Attenborough, in the county of Nottinghamshire, a British subject, do hereby declare the nature of this invention to be as follows:—

This invention comprises improvements in porous elastic fabric and in the production thereof.

A disadvantage hitherto associated with stretchable fabrics such as knitted fabrics is that stretch is generally only obtainable to any appreciable degree in one direction.

An object of this invention is to overcome this limitation and to provide a porous elastic fabric having stretch in more than one direction.

In the specification of my prior Patent No. 405,970 is disclosed a method of producing a composite elastic and porous rubberised fabric in which a stretchable fabric is, whilst under tension, sprayed with a vulcanisable rubber latex and placed face to face upon other fabrics similarly treated.

It has now been discovered that by spraying the surface of a stretchable fabric or garment whilst under tension in a direction at right angles to the wales, that is to say in the direction of the natural stretch of the fabric, a porous rubberised elastic fabric is produced possessing a dual stretch, or a stretch in more than one direction.

This result is effected by tensioning the stretchable fabric base in a direction of its natural stretch to an extent which is less than the maximum stretch obtainable, a suitable tension for example being approximately two thirds of its possible stretch, but other proportions may be found satisfactory according to the nature of the fabric employed, for example: stretchable knitted fabrics may be composed of wool, cotton, silk, art silk or combinations thereof and the surface of which may be treated by raising, smoothing, decorating by blowing thereon powdered or cut fibrous or other suitable material, or other suitable operation that does not impede the natural stretchability or porosity of the cloth.

The untreated surface of the fabric is [Price 1/-]

then sprayed with a suitable vulcanisable latex and it will then be found that this results in fixing the fabric approximately to the width to which it has been tensioned, and when the sprayed fabric has been dried and vulcanised, a porous elastic and rubberised fabric is provided possessing stretchability in more than one direction.

In carrying out this process, it is preferable to provide a temperature maintained at about 70° F. during the operation of spraying, this, however, may be varied to suit the particular fabric employed as a base, which may be also warmed if desired. This may be effected by any suitable means and controlled thermostatically.

In producing laminated fabrics, and particularly when dealing with comparatively short pieces, the spraying may be effected while the fabric is tensioned on to frames, and while still under tension a fabric piece is placed face to face upon another similarly treated piece whilst they are in a wet or tacky condition, and the combined fabric is then subjected to a slight pressure. Longer lengths may be mounted on rollers and the fabric conveniently positioned and tensioned as it is unrolled, the treated surfaces being combined by meeting between calendar rollers, which may be spring mounted and adjustable as regards the pressure applied to the fabric to effect lamination. The rollers may be heated to assist the drying of the laminated fabric, which may in turn pass over a hot plate.

The tensioning may be effected by means of guide rolls, clips or pins gripping the edges of the fabric during the spraying operation.

Spraying is applied in the form of a mist and may be applied by means of automatic or non automatic spray guns, which may be fixed or movable in any desired direction, and any suitable vulcanisable natural or artificial latex or dispersion of regenerated rubber may be used, or may be pre-vulcanised, and any kind may be coloured.

Dated this 7th day of January, 1935.

ERIC POTTER,
Chartered Patent Agent,
London and Nottingham.

COMPLETE SPECIFICATION

Improvements in Porous Elastic Fabrics and in the Production thereof.

I, PERCY HERBERT HEAD, a British Subject, of The Orchards, Station Road, Attenborough, Nottinghamshire, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention comprises improvements in porous elastic fabrics and in the production thereof.

A disadvantage hitherto associated with textile fabric is that same is usually only stretchable to any appreciable degree in one direction. For example, knitted fabric while being capable of considerable extensibility in the direction of the stitch courses, at right angles to the stitch wales, has practically no stretch in the direction of the stitch wales, and it is an important object of the present invention to provide a porous elastic fabric, e.g. a knitted fabric, which is not limited to stretch in one direction only.

In the Specification of my prior Patent No. 405,970 is disclosed a method of producing a composite elastic and porous rubberised fabric in which a stretchable material is, whilst under tension, sprayed with a vulcanisable rubber latex and placed face to face upon other material similarly treated. Subsequent experiments have, however, shown that if surface spraying of stretchable fabric with vulcanisable rubber latex is effected while said fabric is stretched to a certain degree in the direction of the natural stretch of said fabric (e.g. in a direction at right angles to the stitch wales of knitted fabric) a porous rubberised elastic fabric is produced capable of being appreciably stretched in at least two directions.

It is of course well known to produce a knitted fabric capable of being stretched in directions at right angles to each other by the employment of elastic threads, but this invention provides a process of producing a fabric stretchable in more than one direction, e.g. in directions at right angles to each other, by coating same with rubber latex, without appreciably impairing the porosity of said fabric.

It has already been proposed to impart elasticity to a knitted fabric by stretching the fabric in one direction after sub-

jecting the fabric to a moisture treatment, allowing the fabric to dry in its stretched condition and then vulcanizing a sheet of rubber on to one face of the fabric.

It is also known in the case of an elastic fabric incorporating rubber strands to spray the fabric whilst in a stretched condition with rubber latex or the like and to dust fibre on to the latex coating.

The method of producing a porous elastic fabric according to the invention consists in tensioning a stretchable non-rubber fabric base, e.g., a textile fabric such as knitted fabric, in the direction of its natural stretch to an extent less than the maximum stretch obtainable, surface treating said base while under tension with a suitable vulcanisable rubber latex and maintaining the rubberised fabric under tension until the coating dries or sets. By this method it will be found that the fabric when dried is fixed at approximately the width or degree of stretch to which same has been tensioned, and consequently a porous elastic and rubberised fabric is produced possessing extensibility in more than one direction.

To maintain porosity of the finished product the latex is advantageously applied to the fabric base in the form of a fine mist or spray which does not completely fill up or seal the perforations in or interstices of the base.

The invention also includes an additional surface treatment of fabric as above which consists in adhering to the rubber-sprayed surface or surfaces a coating of fluff, lint, fly, flock, or powdered fibre, which operation does not impair either the stretchability or porosity of the fabric. A fabric so treated may with advantage be employed for the manufacture of underclothing, a fleecy or downy surface being produced which, if desired, may be presented nearest to the skin of the wearer.

The invention is applicable to either single rubberised fabrics or to the production of composite (laminated) fabrics, and in the latter case the latex treatment may be effected only on those surfaces of the laminations which are subsequently adhered together. If desired, however, the outer surface or surfaces of the laminated fabric may also be rubberised and

subsequently coated with fluff or equivalent substance as above.

In one method of carrying out the invention same will be described by way of example as applied to the treatment of knitted fabric, which may be composed of wool, cotton, silk, artificial silk or combinations thereof, or other suitable yarn or fibre, although it is to be understood that the invention is not restricted to knitted fabric. The fabric is stretched in the direction of its natural stretch, which in the case of a knitted fabric will be at right angles to the stitch wales, to an extent less than the maximum stretch obtainable, a suitable tension being for example approximately two-thirds of its full possible stretch, although other proportions may be found satisfactory according to the particular nature of the fabric employed. While so stretched, the surface of the fabric is sprayed with suitable vulcanisable latex, said spraying being preferably effected at a temperature maintained at about 70° F. The temperature may, however, be varied in accordance with the particular base fabric being treated, and/or the properties of the latex, and the fabric may itself be warmed prior to spraying. The requisite temperature may be produced by any suitable means and controlled thermostatically. Spray is applied in the form of a mist and the application may be effected by automatic or non-automatic spraying guns which may be fixed or adjustable in any desired direction. The term vulcanisable latex includes any suitable vulcanisable natural or artificial latex or dispersion of regenerated rubber; or if desired a pre-vulcanised rubber may be used. Also the latex may be coloured to suit particular requirements.

After the spraying has been effected the latex is dried while the fabric is still maintained under tension and, if required the latex is vulcanised, and in this manner the fabric is fixed by the rubber approximately to the width to which it has been stretched. Thus a porous rubberised elastic fabric is produced which possesses stretchability in both directions, i.e. in the direction of the stitch wales and also at right angles thereto.

Immediately the fabric has been sprayed and while still in the stretched condition the surface may be further treated by blowing thereon powder, flock, fluff, or fibrous material as before-mentioned, which material may, if desired, be such as to produce a fleecy, downy or suede-like face. Instead of applying said surface material by blowing, same may be allowed to fall by gravity on to the fabric in such a manner that the fibres are not

compacted.

The application of the powder, flock, fluff or the like may be employed for decorative purposes in which case material of various colours may be deposited in pre-arranged designs which can be controlled by stencil plates.

When laminated fabrics are being produced, each layer or lamination is rubber treated as before-described and while still under tension said layers brought face to face with their treated surfaces together while in a wet or tacky condition, after which the combined fabric is subjected to a slight pressure. In the case of comparatively short pieces of fabric same may be tensioned on to suitable frames and held by clips, pins or the like gripping the edges of the fabric. Longer lengths of fabric, however, may be mounted on rollers and the fabric conveniently positioned and tensioned as same as unrolled, the latex-treated surfaces being combined by meeting between calendar rollers either or both of which may be spring-mounted and adjustable as regards the pressure applied to the laminations. The rollers may be heated to assist the drying of the laminated fabric, and said fabric may be passed over a hot plate or through a heated zone.

Laminated fabrics made in accordance with this invention may be coated on either one or both faces with fluff or suitable powdered substance, in the manner described herein.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A method of producing a porous elastic fabric which consists in stretching a stretchable non-rubber fabric base, e.g., a textile fabric such as knitted fabric, in the direction of its natural stretch to an extent less than the maximum stretch obtainable, treating said base while under tension with a vulcanisable or vulcanised rubber latex and maintaining the rubberised fabric under tension until dry or set.

2. A method as in claim 1 wherein the vulcanisable rubber latex is applied in the form of a fine spray or mist.

3. A method as in claim 1 or 2 applied to the production of a porous laminated elastic fabric wherein the fabric bases after treatment are placed together whilst in a stretched condition and with their latex coated faces in contact, the fabric bases being then subjected to slight pressure to unite them firmly together.

4. A method as in claim 1 or 2 wherein the surface of the fabric base is treated by blowing thereon powdered or cut

fibrous material.

5. A method of producing a porous elastic fabric substantially as hereinbefore described.

5 6. A porous elastic fabric substantially as hereinbefore described.

Dated this 9th day of March, 1935.

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